It is not believed that extensions of time are required beyond those, which may otherwise be provided for in documents accompanying this Amendment. However, in the event that additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 CFR §1.136(a), and any fees required therefor are hereby authorized to be charged to our Deposit Account 19-2555.

Kindly enter the following amendment:

IN THE FIGURES

Please substitute the enclosed drawing sheet illustrating Figure 20 that is addressed to the Chief Draftsperson for Figure 20 as filed.

IN THE SPECIFICATION

Please replace the "Related Application" paragraph beginning on page 1, line 10 with the following paragraph:

This application is a continuation-in-part of U.S. patent application serial number 09/136,897 filed on 19 August 1998 now U.S. Patent No. 6,031,615 which claims priority from provisional application number 60/059,740 filed on 22 September 1997 which are both incorporated by reference herein in their entirety.

Please amend the paragraph beginning on page 61, line 9 as follows:

The system shown in Figure 20 operates in a manner similar to that shown in Figure 2. This system has a input aperture 2016 in the integrating sphere 218 which is slightly larger than the optical beam so that the beam is not eclipsed by the opening. The integrating sphere 218 has a hole 2022 in its bottom that allows the beam to strike the disk and reflect out of the integrating sphere through an aperture 2024. Aperture 2024 is slightly larger than the beam to allow the beam to pass through without being eclipsed. The location of aperture 2024 is less than 1 cm from the surface of the disk. The diameter of aperture 2024 can control the minimum spatial frequency of roughness, which the device can measure according to equation (3), discussed *supra*. The integrating sphere includes an opening at its top 2018 to allow scattered light to strike the scattered photodetector 224B. The specular beam is directed onto a collimating lens 220 which prevents the beam from spreading. After passing through the collimating lens it passes into a miniature integrating sphere 2028 through an opening 2030. The integrating sphere reduces the sensitivity of the photodetector to disk distortion and runout. A distorted disk is one which differs from a perfect flat plane. The manufacturing process or the process of clamping the disk on the spindle can cause distortion of a disk. Disk runout is the motion of the disk in the vertical direction caused by imperfection in the spindle and mechanical vibrations of the disk. The specular intensity is detected via a hole 2032 in the miniature integrating sphere with a specular photodetector 224A. The hole 2030 is designed to be larger than the collimated specular beam so that the beam is not eclipsed by the beam. The integrating sphere 2028 is rotated slightly in the plane of the paper so that its entrance port is not perpendicular to the beam. This means that the reflected signal from the back of the integrating sphere 2028 will not retro-reflect down the optical path into the scattered light integrating sphere 218. Retro-reflect means

to reflect substantially directly down the path of the incoming laser beam. The amount of reflected light which gets into the integrating sphere 218 is further reduced by using an opaque black baffle 2026 placed between the integrating sphere 218 and the collimating lens 220. Another means of reducing the sensitivity of the specular photodetector 224A to disk distortion is to place a diffuser (not shown) such as the diffuser 222 shown in Figure 2 in front of the specular photodetector 224A.

Please replace the paragraph beginning on page 77 line 4 with:

After passing through the non-polarizing beam splitter the other half of the beam is recollimated with a lens 220. It then passes through a mechanically rotatable quarter wave plate 2906 available from CVI Laser Corp. The beam is then polarization split with a Wollaston prism 2908 available from CVI Laser Corp., for example, and each polarization component is detected with a separate photodetector. The plane of the Wollaston prism (the plane of the S and P components) is adjusted at 45 degrees to the plane of incidence. The first mixed component of the beam (which includes both P and S components with respect to the plane of incidence) is directed to a conventional photodiode 2912 available from Hamamatsu Corp., for example, and the second mixed component (which includes both P and S components with respect to the plane of incidence) is directed to a conventional photodiode 2910. The photodiodes have a diffuser 210 placed in front of them to reduce the residual position sensitivity of the photodiodes. The difference between the photodetectors is proportional to the cosine of the phase difference between the first and second mixed components coming from the Wollaston prism. As a result this instrument can get different types of information when used in different modes.

Please amend the paragraph beginning on page 77, line 23 as follows:

When the polarization is adjusted to P, the P specular and P scattered light is measured resulting in sensitive measurements of carbon thickness and carbon wear. The P specular signal is obtained by rotating the half wave plate 2904 so that the incident polarization is P. The P specular signal is given by the sum of the signal from 2912 and 2910. When the polarization is adjusted to 45 degrees (exactly between P and S polarization) the instrument is most sensitive to measurements of the phase change induced by changes in the thickness of the thin films on the disk surface. In the phase shift mode the instrument measures lubricant thickness and carbon thickness on thin film disks. The phase shift is measured by taking the difference between the signals measured at 2912 and 2910. This gives an output that is proportional to the cosine of the phase difference between the first and second mixed components of the wave. The orientation of the quarter wave plate 2906 is adjusted to optimize the sensitivity to lubricant and carbon wear or thickness. The individual components may also be measured; that is, the first and second mixed components of the 45 degrees polarized light. These are measured simultaneously with the phase shift and the scattered light.

Please replace the paragraph beginning on page 78, line 19 with:

The first and second mixed components of the 45 degree linearly polarized light are referred to as S_Q and P_Q. When these components of the phase shift are plotted in a two dimensional concentration histogram the interpretation of the data becomes as shown in Figure 31. Carbon wear is seen in the second quadrant, carbon thickness variation on the disk surface is the length of the body of the histogram, debris is in the third quadrant, and degraded lube and lube pooling is in the fourth quadrant.